



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/830,004	04/23/2004	Asano Tosiya	03560.003454	7655
5514	7590	02/28/2006	EXAMINER	
FITZPATRICK CELLA HARPER & SCINTO 30 ROCKEFELLER PLAZA NEW YORK, NY 10112			HOANG, ANN THI	
			ART UNIT	PAPER NUMBER
			2836	

DATE MAILED: 02/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/830,004

Applicant(s)

TOSIYA, ASANO

Examiner

Ann T. Hoang

Art Unit

2836

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. ____.  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>5/26/04</u> .   | 6) <input type="checkbox"/> Other: ____.                                    |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 27, 55, 58, M1, M2. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

2. Claim 12 is objected to because of the following informalities: There appears to be a typo, "from responsive to," in line 7 of the claim. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boon et al. (US 5,227,948) in view of Nakasuji (US 2002/0121615).

Regarding claim 1, Boon et al. discloses a magnetic guiding apparatus for guiding a moving member (5, 9, 21) by attracting a target (1) by electromagnets (13, 15, 17, 19) provided on the moving member (5, 9, 21), said apparatus comprising position measuring means (29, 31) for measuring a position of the electromagnets (13, 15, 17, 19) relative to the target (1) and control means (25a, 25b) responsive to position information from said position measuring means (29, 31) for detecting a position of the electromagnets (13, 15, 17, 19) and bringing them closer to their desired position. The position measuring means (29, 31) are fitted into the electromagnets. See abstract; Fig. 1-2; column 4, lines 41-61; and column 5, lines 12-28. The reference does not disclose magnetic flux detection means for detecting a magnetic flux of the target (1), nor does it disclose a means for performing demagnetization at the detected position of the magnetic flux.

However, Nakasuji discloses a magnetic field detection means (21) in the form of a search coil for detecting stray floating magnetic fields during manufacturing of microelectronic devices so as to prevent adverse effects of such fields. Magnetic field

Art Unit: 2836

detection means (21) would naturally be used to detect magnetic flux, since magnetic flux in an area is a direct product of the magnetic field that penetrates the area. The reference also discloses a control means (28, 29) responsive to said magnetic flux information from said magnetic flux detection means (21), and a means for performing demagnetization (22) responsive to control means (28, 29), also in the embodiment of a coil. Furthermore, the reference discloses that the magnetic field detection means (21) and the means for performing demagnetization (22) can be combined into a single coil configured to perform both function in order for the system to be made more compact. See abstract; Fig. 1; and paragraphs 15 and 28. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the combined coil, which serves as magnetic flux detection means and means for performing demagnetization, in the electromagnets of Boone et al., as well as to combine the control means of Boon et al. and Nakasuji in order to provide a means of detecting a magnetic flux of the target and perform demagnetization in the location of the magnetic flux so as to prevent adverse effects on such fluxes on the system. Since the position measuring means (29, 31) of Boon et al. senses the position of the electromagnets (13, 15, 17, 19) and the magnetic flux detection means (21) of Nakasuji would be a coil of an electromagnet (13, 15, 17, 19), then the position measuring means would also be a means for measuring a position of said magnetic flux detection means (21). Additionally, it is understood that the control means (28, 29) must receive and retain some type of positional information from the magnetic flux detection means (21), as this would be required in order to

perform demagnetization at the appropriate locations. See paragraph 12. This positional information would be incorporated into the combined control means as well.

Regarding claim 2, Boon et al. discloses a storing means (69, 71) in the form of digital memory. It would have been obvious to one of ordinary skill in the art at the time of the invention to identify a magnetized position at the target by moving said magnetic flux detection means over an entirety of a movable region on the target while detecting the magnetic flux by said magnetic flux detection means in order to effectively test the entire area of the target for magnetic flux and demagnetize all of the target. The position information and magnetic flux information of the target would be stored in said storing means (69, 71) in order for the control means to signal for demagnetization in the appropriate locations of the magnetic flux.

Regarding claim 3, said magnetic flux detection means (21) would be mounted on the moving member (5, 9, 21), since the magnetic flux detection means (21) would be the coil of an electromagnet (13, 15, 17, 19) provided on the moving member (5, 9, 21). See above rejection on claim 1.

Regarding claim 4, demagnetization would be performed by moving the electromagnets (13, 15, 17, 19) to the position of the magnetic flux in response to the combined control means of Boon et al. and Nakasuji, which would act on position information from the position measuring means (29, 31) and the magnetic flux information from the magnetic flux detection means (21). See above rejection on claim 1. The electromagnets (13, 15, 17, 19) would be provided with a current signal by said control means, as Nakasuji discloses the means for performing demagnetization (22),

which would be mounted to an electromagnet (13, 15, 17, 19), to be provided with a current signal by control means (28, 29). See paragraph 32.

Regarding claim 5, at least one of the electromagnets (13, 15, 17, 19) would be used as said magnetic flux detection means (21), since said magnetic-flux detection means (21) would be the coil of an electromagnet (13, 15, 17, 19). See above rejection on claim 1.

Regarding claim 6, Nakasuji discloses a stage apparatus (41) for holding a substrate (23) during manufacturing of a microelectronic device. See Fig. 1. The reference discloses that the substrate (23) is continuously moving in a lateral direction. See paragraph 30. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the magnetic guiding apparatus discussed above in the stage apparatus of Nakasuji in order to provide an effective means for the substrate to continuously move back and forth so as to expose all the subfields on a reticle to a die on the substrate.

Regarding claim 7, Nakasuji discloses an exposure apparatus for positioning at least one of a substrate (23) and an original (10) by a stage apparatus (41). See Fig. 1.

Regarding claim 8, Nakasuji discloses a step of manufacturing devices by the exposure apparatus. See Fig. 3-4 and paragraphs 47-48.

Regarding claim 9, Boon et al. discloses a stage apparatus comprising: a target (1) extending along a direction; a moving member (5, 9, 21) supported by said target (1) and movable along said target; electromagnets (13, 15, 17, 19) provided at said moving member (5, 9, 21) and producing a force between said target (1) and electromagnets

(13, 15, 17, 19); position measuring means (29, 31) for measuring a position of said electromagnets (13, 15, 17, 19) which are on said moving member (5, 9, 21); and control means (35). See abstract; Fig. 1-2; column 4, lines 41-61; and column 5, lines 12-28. The reference does not disclose magnetic flux detection means provided on the moving member (5, 9, 21) for detecting a magnetic flux of said target (1) or a means of detecting the position of a magnetic flux.

However, Nakasuji et al. discloses a magnetic flux detection means (21) in the form of a search coil that would be used to detect a magnetic flux resulting from stray floating magnetic fields during manufacturing of microelectronic devices. Furthermore, the reference discloses a control means (28, 29) responsive to said magnetic flux information from said magnetic flux detection means (21) and that the search coil can embody the magnetic field detection means (21) as well as a means for performing demagnetization (22). See abstract; Fig. 1; and paragraphs 15 and 28. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the combined coil, which serves as magnetic flux detection means and means for performing demagnetization, in the electromagnets of Boone et al., as well as to combine the control means of Boone et al. and Nakasuji in order to provide a means of detecting a magnetic flux of the target and perform demagnetization in the location of the magnetic flux so as to prevent adverse effects on such fluxes on the system. Since the position measuring means (29, 31) of Boone et al. senses the position of the electromagnets (13, 15, 17, 19) and the magnetic flux detection means (21) of Nakasuji would be a coil of an electromagnet (13, 15, 17, 19), then the position measuring means

Art Unit: 2836

would also be a means for measuring a position of said magnetic flux detection means (21). Additionally, it is understood that the control means (28, 29) of Nakasuji would be required to receive and retain some type of positional information from the magnetic flux detection means (21) in order to perform demagnetization at the appropriate locations, and this positional information would be incorporated into the combined control means as well.

Regarding claim 10, said control means would reduce said magnetic flux, as Nakasuji discloses that control means (28, 29) supplies to a means for performing demagnetization (22) an electrical current that cancels the magnetic field, or magnetic flux. See paragraph 32.

Regarding claim 11, it is well known and expedient in the art to use a servo positioning system for positioning magnetic guiding apparatuses and moving members in general. Furthermore, it is understood that the control means (28, 29) of Nakasuji would be required to receive and retain some type of positional information from the magnetic flux detection means (21) in order to perform demagnetization at the appropriate locations and that the demagnetization performed by means for performing demagnetization (22) would be specific to the positional information. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to deactivate the servo positioning system during a reduction of the magnetic flux in order to avoid interfering with the demagnetization being performed, since the demagnetization would be specific to a position and an active servo would compromise that position.

Regarding claim 12, the recited method steps would necessarily be performed in the usage of the above mentioned magnetic guiding apparatus.

Regarding claim 13, Boon et al. discloses a magnetic guiding apparatus for guiding a moving member (5, 9, 21) by attracting a target (1) by electromagnets (13, 15, 17, 19) provided on the moving member (5, 9, 21), said apparatus comprising a position measuring unit (29, 31) for measuring a position of the electromagnets (13, 15, 17, 19); and a controller (35) responsive to position information from said position measuring unit (29, 31). The reference does not disclose a magnetic flux detector movable along the target (1), for detecting a magnetic flux of the target (1), or means performing demagnetization at the detected position of the magnetic flux.

However, Nakasuji et al. discloses a magnetic flux detector (21) in the form of a search coil that would be used to detect a magnetic flux resulting from stray floating magnetic fields during manufacturing of microelectronic devices. Furthermore, the reference discloses a control means (28, 29) responsive to said magnetic flux information from said magnetic flux detection means (21) and that the search coil can embody the magnetic field detection means (21) as well as a means for performing demagnetization (22). See abstract; Fig. 1; and paragraphs 15 and 28. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the combined coil, which serves as magnetic flux detection means and means for performing demagnetization, in the electromagnets of Boone et al., as well as to combine the control means of Boon et al. and Nakasuji in order to provide a means of detecting a magnetic flux of the target and perform demagnetization in the location of

the magnetic flux so as to prevent adverse effects on such fluxes on the system. Since the position measuring means (29, 31) of Boon et al. senses the position of the electromagnets (13, 15, 17, 19) and the magnetic flux detection means (21) of Nakasuji would be a coil of an electromagnet (13, 15, 17, 19), then the position measuring means would also be a means for measuring a position of said magnetic flux detection means (21). Additionally, it is understood that the control means (28, 29) of Nakasuji would be required to receive and retain some type of positional information from the magnetic flux detection means (21) in order to perform demagnetization at the appropriate locations, and this positional information would be incorporated into the combined control means as well.

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nakamura et al. (US 2003/0043486) discloses a magnetic-pattern transferring method comprising a moving electromagnet, a current controller, and a stage controller, controlled by a main controller and memory. Yamanodera et al. (JP 02-295889) discloses a lifting magnet crane device comprising magnetic flux detecting means, current supply means, and a CPU processing means. Ishikawa et al. (JP 10-244566) discloses a mold clamping device controlled by feedback, comprising a magnetic flux detector, an electromagnet controller, and current command generators.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ann T. Hoang, whose telephone number is 571-272-2724. The examiner can normally be reached Monday through Friday, 8:00 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus, can be reached at 571-272-2058. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ATH  
2/17/06



PHUONG T. VU  
PATENT EXAMINER